

**FIRST REPORT OF *ACROCLISOIDES* GIRAULT AND DODD  
(HYMENOPTERA: PTEROMALIDAE) IN THE WESTERN HEMISPHERE,  
WITH DESCRIPTION OF A NEW SPECIES**

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*Abstract.*—*Acroclisoides solus* Grissell and Smith, new species, is the first representative of the genus reported in the Western Hemisphere. Specimens were collected in Hardy County, West Virginia, and Fairfax County, Virginia, USA. The biology of most species of *Acroclisoides*, including *A. solus*, is unknown. Of the 13 Eastern Hemisphere species, six are associated with eggs of Pentatomidae and/or Scutelleridae (Heteroptera), with at least four of these reared as hyperparasitoids of scelionid (Scelionidae: Hymenoptera) primary egg parasitoids. It seems likely that all species of *Acroclisoides* will be found to be associated with heteropteran eggs, possibly as facultative or obligate hyperparasitoids through primary parasitoid hosts.

*Key Words:* Hymenoptera, Chalcidoidea, Pteromalidae, *Acroclisoides* new species, Western Hemisphere

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The genus *Acroclisoides* Girault and Dodd is known from 13 species found throughout the Afrotropical, Australian, Oriental, and Palearctic regions (Noyes 2003). In this paper we describe the first species of the genus reported from the Western Hemisphere.

Host records for members of the genus are poorly documented, but at least six species are associated with eggs of Pentatomidae and/or Scutelleridae (Noyes 2003, Rider 2004). Several rearings demonstrated that *Acroclisoides* is a hyperparasitoid of eggs parasitized by members of the family Scelionidae (Hymenoptera). As detailed next, many reported pentatomid egg rearings of *Acroclisoides* spp. were reported with associated primary scelionid species and

rarely Eupelmidae (Hymenoptera), but there was no demonstrated association of these species with each other. It may be that all species of *Acroclisoides* are associated with heteropteran eggs as hyperparasitoids through primary parasitoids. Specific rearing records can be summarized as follows, with all primary hosts being Pentatomidae unless noted otherwise:

*Acroclisoides africanus* Ferrière: In Africa, this species was reared from eggs of *Antestiopsis thunbergii thunbergii* (Gmelin) (as *Antestia lineaticollis* Stål) (Ferrière 1940) with another record from a species of *Trissolcus* Ashmead (as *Asolcus* Nakagawa) (Scelionidae) associated with several unnamed pentatomids (Anonymous 1968). Risbec (1951) re-

ported eggs of *Atelocera* (as *Atalecore*) *notatipennis* Stål as host. The following hosts were listed by LePelley (1959): *Antestiopsis facetoides* Greathead, *A. intricata* (Ghesquiere and Carayon), *A. thunbergii bechuana* (Kirkaldy), and *A. thunbergii ghesquierei* (Carayon). Rider (2004) summarized reports of many species of Scelionidae reared from eggs of the above pentatomid hosts.

*Acroclisoides bicolor* Luo and Qin: This species, from People's Republic of China, was reared from eggs of *Halyomorpha picus* (Fabricius) (Luo and Qin 1991).

*Acroclisoides indicus* Ferrière: In People's Republic of China and India this species was reared from pentatomid eggs (Ferrière 1931), eggs of *Erthesina* sp. (Xiao and Huang 2000), and eggs of *Placosternum dama* F. (Thirumalai and Ananthakrishnan 1977).

*Acroclisoides luzonensis* Gahan (wrongly cited as *A. major* by Thirumalai and Ananthakrishnan 1977): This species, known from the Philippines and People's Republic of China, was originally reported as an egg parasitoid of *Tectocoris lineola* F. and possibly a hyperparasitoid of *Trissolcus* (as *Aphanurus*) *banksi* (Gahan) (Gahan 1920). Baltazar (1966) reported it as a hyperparasitoid of *Trissolcus banksi* associated with Scutellaridae.

*Acroclisoides ?megacephalus* Girault and Dodd: This questionably identified Australian species was reared from eggs of *Axiagastus cambelli* Distant, along with *Anastatus* sp. (Eupelmidae) and *Trissolcus pamei* (Ferrière) (Baloch 1973), but no distinct relationship was demonstrated between these parasitoids.

*Acroclisoides tectacorsi* (Girault): In Australia, this species was reared from *Tectocoris banksii* Donovan (Girault 1924) [Scutelleridae], *Biprorulus bibax* Breddin (James 1990, Polaszek 1991) and *Oechalia consocialis* (Boisduval) (Thompson 1958). Cassis and Gross

(2002) listed eight species of Scelionidae reared from *B. bibax* but they did not specifically associate any of these species with *Acroclisoides*.

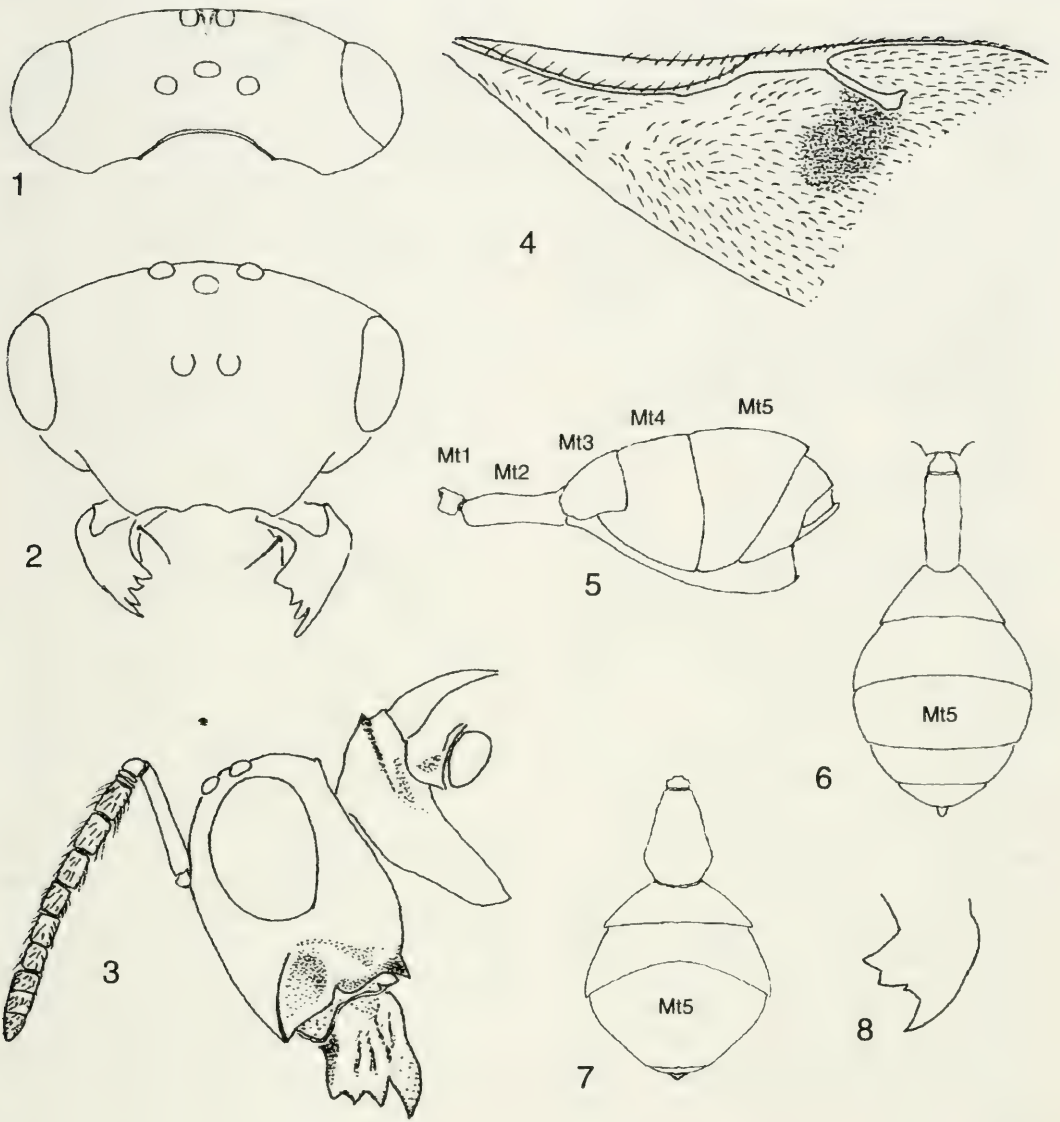
Two undetermined species of *Acroclisoides* in Australia were reared from eggs of *Nezara viridula* L. (green stink bug, also called green vegetable bug) and *Oechalia schellenbergii* (Guérin-Méneville) (predatory shield bug) (Clarke and Seymour 1992). The former host eggs were demonstrated to be hyperparasitized through the primary parasitoid *Trissolcus basalis* (Wollaston) in laboratory tests. Loch and Walter (1999) reported a 20% hyperparasitism rate for the same hosts, but they could not determine whether *Acroclisoides* was obligatory or facultative. Additionally, in Australia, an unknown species of *Acroclisoides* was reared from eggs of *Plautia affinis* (Dallas) as was *Trissolcus basalis*, *T. aenone* (Dodd), and *Telenomus* sp. [Scelionidae] (Cassis and Gross 2002). In Japan, an unknown *Acroclisoides* was reared from eggs of *Plautia stali* Scott along with *Trissolcus japonicus* (Ashmead) (as *T. plautiae* (Watanabe)) and *Telenomus* sp. (Tachikawa et al. 1977)

#### *Acroclisoides* Girault and Dodd

*Acroclisoides* Girault and Dodd (in Girault 1915): 334. Type-species: *Acroclisoides megacephalus* Girault and Dodd, original designation.

*Neocoruna* Huang and Liao 1988: 426–427 (English summary 427–428). Synonymized by Xiao and Huang 2000: 94. Type-species: *Neocoruna sinica* Huang and Liao, original designation.

Bouček (1988: 444) stated that *Acroclisoides* was difficult to associate "... closely with any other genus of Pteromalinae." The genus itself is easily distinguished from other pteromalids by a combination of the following characters: head much wider than high (Fig. 2) and much wider than mesosoma; clypeus



Figs. 1-8. *Acroclisoides solus*, female. 1-3 Head. 1, Dorsal. 2, Frontal. 3, Lateral. 4, Forewing, apex and ventral setae not shown. 5-7, Metasoma, showing typical (5-6) and variable (7) shapes. 5, Lateral. 6-7, Dorsal. 8, Left mandibular teeth, showing variation. Mt*i* = metasomal tergum number.

distinctly emarginate (Fig. 2); occipital carina present (Fig. 1); gena deeply concave and outlined by carina along anterior edge (Fig. 3); posteroventral margin of gena with angulate projection (Fig. 3); antennae inserted high above center of face (Fig. 2); pronotum with anterior raised transverse carina (Fig. 3); notauli well developed and complete;

frenum indicated by change in sculpture and weak groove; marginal vein slightly thickened (Fig. 4); postmarginal and stigmal veins equal to or longer than marginal vein (Figs. 4, 13, 14); metasomal tergum 2 (Mt 2) narrowly constricted and appearing narrowly or triangularly petiolate (the true petiole [Mt1] is essentially transverse) (Figs. 5, 6).

*Acroclisoides* keys to the genus *Coruna* Walker (couplet 92) in the key to Nearctic genera of Pteromalidae (Bouček and Heydon 1997) but differs from it as follows: antenna situated distinctly above center of face (below in *Coruna*), face distinctly wider than high (about as wide as high in *Coruna*), clypeus slightly emarginate (with a median projection in *Coruna*), presence of a large carinate malar depression (slight, acarinate depression in *Coruna*), and a posteroventral genal angulation (absent in *Coruna*).

The following keys to species of *Acroclisoides* are somewhat useful at regional levels: Ferrière 1931 (5 Indoaustralian species); Xiao and Huang 2000 (5 Palearctic/Oriental species, in Chinese); Sureshan and Narendran 2002 (2 Indian species). None of these aided substantially in identifying our species, but we consulted them in addition to comparing descriptions and illustrations of all known species as well as specimens of *A. sinicus* (Huang and Liao 1988) to make our identification.

***Acroclisoides solus* Grissell and Smith,  
new species**

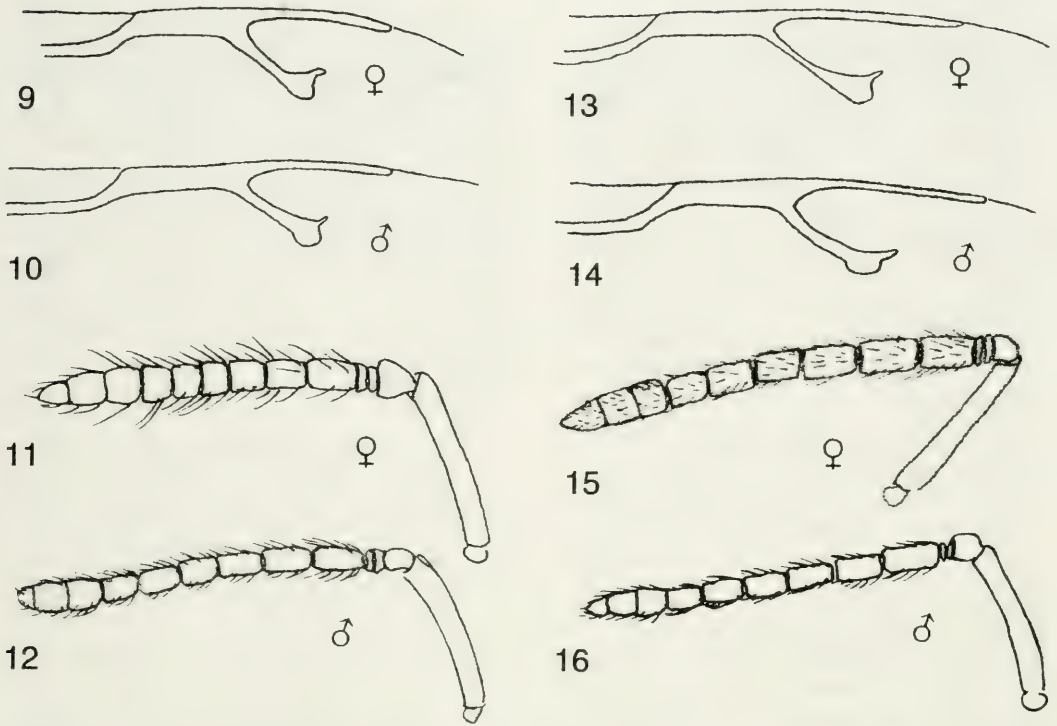
(Figs. 1–8, 13–16)

Holotype female.—Body length 2.0 mm. Generally black with some green reflections; face below toruli bright metallic green; yellow are scape, pedicel, anelli, basal  $\frac{2}{3}$  of mandible, mesocoxa, all legs (except tarsi white); brownish are funiculars 1–5 (except F6 brownish white), clava, wing veins, forewing spot posterior to stigmal vein; mandibular teeth reddish brown. *Head* (Fig. 2): Typical for genus, clypeus slightly emarginate; mandibles each with 4 teeth (Fig. 2); antenna with funicular segments longer than wide (Fig. 15) but with apical segments decreasing in relative length, covered with appressed setae, pedicel about  $\frac{1}{2}$  length of first funicle, clava

slightly longer than funiculars 5+6; ocellular distance about  $1.5\times$  postocellar distance (Fig. 1). *Mesosoma*: Anterior margin of scutellum separated from posterior margin of scutum by 4 polished pits; propodeum with weak median carina extending to distinct, aciculate nucha; lateral plicae indicated by rounded edge, with median area between plicae as heavily reticulate as scutum, area laterad plica smooth and polished to metapleuron, callus with few setae; hindcoxa bare dorsally and with few extremely long setae (as long as coxa) basally; forewing (Fig. 4) with marginal vein slightly thickened, ratio submarginal vein: marginal vein: postmarginal vein: stigmal vein 7:2:3:2; costal cell above with single apical row of setae in distal half (Fig. 4), below with several rows of setae in distal half and single anterior row extending to base; upper surface nearly evenly covered with setae except bare area near parastigma and basal setal line, and paralleling cubital setal line in basal cell. *Metasoma*: Highly polished, appearing bulbous in dorsal view (Figs. 6, 7), visible portion of gastral petiole (Mt1) transverse (about as long as wide if seen in entirety), metasomal tergum 2 (Mt2) about  $\frac{3}{4}$  length of remaining terga and about  $1.5\times$  as long as wide [Fig. 7, most paratypes display a more typical cylindrical configuration and longer gaster as shown in Figs. 5–6, see variation discussion below]; posterior margin of Mt4 broadly concave; Mt5 covering  $\frac{1}{2}$  gaster beyond Mt2; hypopygium extending nearly to apex of gaster with ovipositor sheaths seen only for short distance ventrally (Fig. 5).

Male.—Color as for female except F6+7 both brownish white and wing hyaline; clava subequal to F6+7; Mt2 about  $2\times$  longer than broad; ratio of Mt2:Mt3:Mt4:Mt5:Mt6 as 10:9:6:10:4.

Type material.—Holotype ♀, West Virginia, Hardy County, 3 mi. NE Mathias, 38°55'N 78°49'W, 30-VII to



Figs. 9–16. *Acroclisoides* species. 9–12, *A. sinicus*. 9–10, Forewing venation. 11–12, Antenna. 13–16, *A. solus*. 13–14, Forewing venation. 15–16, Antenna.

12-VIII-2004, D. R. Smith collector, Malaise trap. Paratypes, 25 ♀, 1 ♂: 2 ♀, same data as holotype; 2 ♀, 1 ♂, same except 16-19-VII-2004; 1 ♀, 13-26-VIII-2004; 7 ♀, 5-25-IV-2005; 4 ♀, Virginia, Fairfax County, nr. Annandale, 38°50' N, 77°12' W, 22-28-VII-2002, D. R. Smith, Malaise trap; 1 ♀, same except 11-17-VIII-2002; 1 ♀, 31-VIII to 6-IX-2003; 1 ♀, 10-16-VII-2004; 2 ♀, 24-30-VII-2004; 1 ♀, 11-17-VIII-2004; 3 ♀, 28-VIII to 3-IX-2004. Holotype and paratypes in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.

Location and trap.—The Annandale site is a heavily-treed suburban residential lot with numerous ornamental plants. The single Malaise trap was set near silver maples, *Acer saccharinum* L., and *Prunus* spp. The Mathias site is an eastern deciduous forest composed primarily of oak, maple, hickory, and pine.

The dominant oak is chestnut oak (*Quercus prinus* L.). Over 20 Malaise traps were set in this area in openings along forest edges, along dirt roads, and within forests. No attempt was made to monitor catches from specific traps.

Variation.—The appearance of the metasoma of this species is highly variable. This is probably the result of being killed in alcohol and then critical point dried rather than the natural state of living specimens. In most specimens, Mt2 is folded or wrapped under the sternum ventrally and forms a petiole-like tube as shown in Figs. 5 and 6, but in several specimens (including the holotype), the tergum does not wrap ventrally but flairs laterally outward (Fig. 7). Terga Mt2–5 appear flexible, which allows each to vary in relative width and length depending upon the degree of inflation. Terminal terga Mt6–7 may telescope beneath Mt5 (Fig. 7), causing

Mt5 to appear relatively longer with respect to total metasomal length in some specimens. The forewing infumation varies from distinct (Fig. 4) to seen only faintly with indirect light. In most specimens both mandibles have 4 large teeth (Figs. 2, 3), but one female has the left mandible with 3 large teeth and a miniscule point (Fig. 8).

**Etymology.**—From the Latin *solus*, in reference to the only, or sole, member of the genus known from the Western Hemisphere.

**Distribution.**—Virginia and West Virginia.

**Discussion.**—Of the 13 known species of *Acroclisoides*, only 4 have a maculate forewing in females: *A. maculatus* Sureshan and Narendran, *A. megacephalus*, *A. sinicus*, and *A. spilopterus* (Masi). Of these, *A. maculatus* from India has a broad band extending from the postmarginal vein nearly two-thirds of the way to the hind margin of the wing, and its postmarginal vein is twice as long as the marginal vein. It is clearly not conspecific with *A. solus*. *Acroclisoides spilopterus* from the Seychelles has a wider than high spot extending posteriad from the apex of the marginal vein around the stigmal, toward the apex of the wing beyond the stigma about  $\frac{1}{3}$  the spot's own width, and  $\frac{1}{2}$  way to the posterior wing margin. *Acroclisoides magacephalus* has "... an obscure dusky spot just beneath knob of stigmal vein" (Girault 1915).

Only *Acroclisoides solus* and *A. sinicus* have the forewing maculation (Fig. 4) about as wide as high, extending along the entire posterior margin of the stigmal vein, not projecting beyond the stigma toward the apex of the wing, and extending about half way to the posterior margin of the wing. In some specimens of both species, however, this spot is so obscure as to be seen only with difficulty (most easily by transmitted light). *Acroclisoides solus* differs from *A. sinicus* in

both sexes by the postmarginal vein being over  $1.6\times$  the length of the marginal in *A. solus* (Figs. 13, 14) and less than  $1.4\times$  this length in *A. sinicus* (Figs. 9, 10). In females of *A. solus*, the first funicular is  $2\times$  the length of the pedicel, the setae lie relatively flat on the surface of each segment, and the clava is slightly longer than F5+6 (Fig. 15), whereas in *A. sinicus* the first funicular segment is scarcely longer than the pedicel, the setae are outstanding, and the clava is slightly longer than F4+6 (Fig. 11).

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